

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS - DRAFT

D. Pyroprocessing System

- c) Add-on NO_x Control: An Ammonia Injection System (AIS) shall be designed, constructed and operated to achieve the permitted levels for NO_x emissions from the pyroprocessing system. The AIS will include at least aqueous ammonia and/or urea storage tank(s), pumps, piping, compressed air delivery, injectors, control system, ancillary equipment and, at the option of the permittee, a reactor and catalyst. Aqueous ammonia and/or urea solution will be injected at location(s) in the preheater/calcliner or downcomer with appropriate temperature profiles. The applicant may submit an application with supporting information to install an alternative add-on NO_x control system.
6. Particulate Matter (PM/PM₁₀) Controls: The permittee shall install a particulate matter control device consisting of at least a baghouse to remove particulate matter emissions from the pyroprocessing exhaust gas stream to achieve the PM/PM₁₀ emissions standards specified in this permit.
7. Sulfur Dioxide Controls: The permittee shall primarily use low-sulfur raw materials to achieve the SO₂ permitted limits. The permittee is authorized to install a hydrated lime injection system for utilization as needed to reduce SO₂ emissions.

PERFORMANCE REQUIREMENTS

8. Hours of Operation: The hours of operation for this emissions unit are not limited (8760 hours per year). [Rule 62-210.200(PTE), F.A.C.]
9. Process Rate Limitations: Kiln preheater feed rate shall be monitored and recorded for purposes of determining clinker production. The nominal clinker production rate is 160.4 tons per hour (TPH) and shall not exceed 176.5 TPH (24-hour rolling average) and 1,405,100 tons during any consecutive 12 month period. The clinker production rate shall be determined using kiln feed loss on ignition (LOI) factors. The feed rates and kiln feed LOIs shall be based on a 30 operating-day block average of daily measurements. For purposes of this requirement, an operating day is any day that the kiln produces clinker or burns fuel. [Rules 62-4.070(3), and 62-212.200(PTE), F.A.C.]
10. Authorized Fuels: Only the following authorized fuels shall be fired in the pyroprocessing system (kiln and calciner): coal, petroleum coke, tire derived fuel (whole or chipped tires), natural gas, distillate oil, "on-specification" used oil fuel, and other non-hazardous wastes described in paragraph d). The maximum heat input rate to the pyroprocessing system (kiln and calciner) shall not exceed 13,200 MMBtu per day (nominally 550 MMBtu/hr).
- a) The maximum heat input rate from tire derived fuel (TDF) shall not exceed 35% of the total pyroprocessing heat input rate (kiln and calciner) and shall not exceed 200 MMBtu per hour (24-hour rolling basis). TDF may be fed anywhere between the kiln feed shelf and lower cyclone. TDF may be injected through the main kiln burner and the discharge end of the kiln. The whole tire feed mechanisms shall be designed with an airlock/gate system. TDF shall be stored, handled and managed in accordance with the provisions of Chapter 62-711, F.A.C.
- b) The air heater shall fire only natural gas or distillate fuel oil (No. 2 or No. 4) with a design maximum heat input rate of 55 MMBtu per hour.
- c) The firing of "on-specification" used oil fuel shall not exceed 2000 gallons per hour and 3,000,000 gallons during any consecutive 12 months. On-Specification Used Oil Fuel shall meet the following specifications:
1. Arsenic shall not exceed 5.0 ppm;
 2. Cadmium shall not exceed 2.0 ppm;
 3. Chromium shall not exceed 10.0 ppm;
 4. Lead shall not exceed 100.0 ppm;
 5. Total halogens shall not exceed 1000 ppm; and
 6. Flash point shall not be less than 100° F.

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Used oil fired as a fuel may be generated from on site sources or purchased from a vendor. Used oil shall not contain any PCB's. [40 CFR 279.61; 40 CFR 761.20(e); Rule 62-4.070(3), F.A.C.]

- (X)
- d) The maximum heat input rate from other non-hazardous waste shall not exceed 15% of the total pyroprocessing heat input rate (kiln and calciner) and shall not exceed 85 MMBtu per hour (24-hour rolling basis). Such fuels will be stored in enclosed bins or silos, pneumatically fed through a metering system and introduced into the kiln via the main kiln burner. The approved fuels are limited to: rice hulls; corn husks; cotton gin wastes; sugarcane bagasse; sawdust and wood chips from clean untreated and unpainted wood; paper and cardboard; non-chlorinated plastic; citrus peel waste; and carpet derived fuel.
 - e) Prior to initial use of any fuel listed in d) above, the permittee shall provide a notification from the including: origin of the fuel, percent fuel substitution, a schedule for firing such fuels, and a proposal to evaluate emissions of NO_x, CO, VOC and SO₂ from the CEMS record to demonstrate no increase in emissions above permitted levels. Air contaminants to be tested for include (but are not limited to) NO_x, SO₂, and CO.
 - f) The permittee shall maintain records indicating the origin and profile of sawdust and wood chips derived from clean untreated and unpainted wood. The permittee is required to maintain records to demonstrate that material is not and does not contain hazardous waste as defined by Rule 62-730.030, F.A.C., or 40 CFR Part 261.

[Applicant request, Rule 62-4.070(3), F.A.C.]

EMISSIONS AND TESTING REQUIREMENTS

11. Emissions Standards: Emissions from the pyroprocessing system (including the air heater) shall not exceed the following emissions standards.

Pollutant	Emission Limit	Averaging Time	Compliance Method	Basis
CO ^a	2.0 lb/ton of clinker	30-day rolling	CEMS	BACT
	321 lb/hr			
NO _x ^b	1.50 lb/ton of clinker	30-day rolling	CEMS	BACT
	241 lb/hr			
PM/PM ₁₀ ^c	0.10 lb/ton of clinker	Three 1-hr runs	Annual Test	BACT
	17.6 lb/hr			
Visible Emissions	10 % opacity	6-minute block	COMS	BACT
SO ₂	0.20 lb/ton of clinker	24-hr rolling	CEMS	BACT
	32.1 lb/hr			
VOC ^d	0.115 lb/ton of clinker	30-day block	CEMS	BACT
	18.5 lb/hr			
Dioxin/Furan ^e	0.20 ng/dscm (TEQ) @ 7% O ₂	Three 3-hr runs	Temperature Monitoring	NESHAP LLL
	0.40 ng/dscm (TEQ) @ 7% O ₂			
THC ^f	20 ppmvd (as propane)@ 7% O ₂ or 98 percent reduction	1-hour block	CEMS	NESHAP LLL
Mercury ^g	190 lb/12-month period	12-month rolling	Fuel/Materials and/or CEMS	Avoid PSD
	41 µg/dscm @ 7% O ₂	Three 1-hr runs	Annual Test	NESHAP LLL

Cement Kiln

Heat Balance

FLSMIDTH
INSTITUTE

HEAT BALANCE					
PLANT: _____		DATE: _____		PRODUCTION: 2200 t/d	
REFERENCE TEMP. 0°C	°C °F	kg/kg lb/lb	kcal/kg°C BTU/lb°F	kcal/kg	
FUEL: COMBUSTION HEAT				879	
FREE HEAT				4.4	
COMBUSTION AIR: PRIMARY AIR				6.3	
REST				5.0	
GRATE COOLER: EXCESS AIR				7.4	
RAW FEED				20.9	
RETURN DUST				1.9	
WATER VAPOR FROM COAL MILL				0.9	
SUM				925.8	
COMBUSTION PRODUCTS				188.1	
CO2 FROM RAW FEED				51.9	
VAPOR FROM FREE H2O IN FEED				4.7	
VAPOR COMB. H2O IN FEED				1.9	
EXTRA WATER VAPOR				5.3	
DUST				13.1	
RADIATION : KILN				62	
PREHEATER				25	
CALCINING SYSTEM					
COOLER LOSS: HEAT IN CLINKER				25.1	
RADIATION				5	
EXCESS AIR				104.9	
HOT AIR TO COAL MILL				28.6	
HEAT OF FORMATION				410.5	
DIFFERENCE				-0.3	
SUM				925.8	

Figure 7.20 Heat Balance

approx 1350 Btu/lb of kiln

